Technology: Competitive & Complementary

Fairchild's Eu design lab

Fairchild Semiconductor's new Power Design and Application Lab, located in Fuerstenfeldbruck, Germany, is now fully operational. Fairchild is investing $1m in staff, premises and equipment over the first year of the centre's operation.

The aim is to provide power design solutions for electronic applications in the principal European end markets - industrial, consumer, and automotive. The facility has 14 systems and applications engineers, and four component engineers.

Molecular memory

Molecular memory is estimated as practical in 5-7 years, according to researchers at University of California, where a pair of molecules have been bonded to form a two state molecule, composed of photochoromic fulgimide and a dye molecule capable of fluorescence.

The molecule resists accidental erasure, switches quickly, and could be used to store more than a terabyte of data on a removable disk.

When bonded, the pair of molecules form a molecule that has two states. The components are photochromic fulgimide and a dye molecule capable of fluorescence. Specific wavelengths of light cause the molecule to open and close. With 530nm light the molecule opens. At 400nm light it closes.

This allows it to write the zeros and ones for information to a series of molecules. Information stored in the molecules is read at a third wavelength of 650nm. When open molecules absorbed this wavelength, they fluoresce at 700nm.

STMicro and MobiDiags silicon MEMS Biochip system

STMicroelectronics has signed with MobiDiag to create a complete system for genomic-based detection of infectious diseases based on a silicon MEMS biochip.

It is expected to allow infectious disease detection faster and cheaper for clinical diagnostics laboratories and give a user-friendly access to genomic techniques that will revolutionise how infectious diseases are detected.

In 2002, STMicroelectronics had a disposable, standalone device that performs DNA amplification and detection of target DNA sequences.

The polymerase chain reaction technique performed on the device is implemented using a silicon MEMS chip, where buried channels carry the mixture of sample and reagents, and accurate resistive heating elements perform the temperature cycle.

The device only requires small quantities of the costly reagents and disposable cartridges ensure ease of use and reduce risk of sample cross-contamination.

STMicroelectronics and MobiDiag are expected to provide complete systems to its development partners in 2004, with the commercial product being available to diagnostic labs in 2005.

Can compound strut its stuff?

The "i-WEAR" Fashion Show will be presenting the latest developments in intelligent clothing to European consumers in three major cities: Paris, Barcelona and Berlin.

The project takes place in the framework of the European Science and Technology Week, part of the European Union's research programme to inform the public about the latest science and technology developments and trends.

The "i-Wear" fashion show in Paris was on 5 November at Atelier Richelieu 60, rue de Richelieu (Palais de Richelieu), and was organised by Alexandra Fede, stylist for Du Pont de Nemours, Mitsubishi and Wolford.

Technical textiles, intelligent garments, smart fabrics, wearable electronics will play an important role in the future. Clothing incorporating such technologies will not only make a fashion statement, but will also define an unprecedented level of practicality, leading to greater well-being and security.

In the long run, greater levels of acceptance of high tech in clothing will strengthen competitiveness of Europe's technology-driven industries.

Alongside garments from the Alexandra Fede collection, Wolford, France Telecom, Philips and others, ESAs Technology Transfer Programme will be showing various garments incorporating space technologies.

These have been developed under its auspices by Grado Zero Espace, Verhaert et al. The ESA garments will include a shape memory shirt, McLaren cooling suit, Toy Jacket, Aerogel jacket, Spacebra, Babyguard to protect against cot death, and a UV suit to protect against xeroderma pigmentosum.

Si photodiode for optic & microchips

A new silicon light detector could make circuits smaller, cheaper and more robust. The silicon photodiode has been developed by Harvard University researchers.

Currently made from germanium or indium gallium arsenide, photodiodes are not easily allied to silicon. Researchers have been working for a silicon-based material that absorbs more infrared light.

The Harvard solution is a silicon film, exposed to sulphur hexafluoride gas and very short pulses of laser light. This covers the film with nano bumps.

As the light-absorbing layer of the photodiode, the roughened film generates significant electrical current when illuminated by light, with wavelengths of up to 1.65 micro-metres.

The aim now is to discover an even stronger response to light with dopants other than sulphur.

Light sensitive silicon could also be useful for photovoltaics.